Paper No. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte LAWRENCE M. FRAZIER
and BENJAMIN G. LEWIS

Appeal No. 2000-0957
Application 06/344,455[1]

ON BRIEF

Before THOMAS, HAIRSTON, and BARRETT, Administrative Patent Judges.

BARRETT, Administrative Patent Judge.

DECISION ON APPEAL

[1] Application for patent filed February 1, 1982, entitled "System And Method For Bistatically Determining Altitude And Slant Range To A Selected Target." The Secrecy Order (Paper No. 2) entered July 9, 1982, was rescinded by Rescinding Order (Paper No. 27) dated April 7, 2000.

This is a decision on appeal under 35 U.S.C. § 134 from the final rejection of claims 1 and 16. Claims 2-4 and 17-19 have been indicated to be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims.

We affirm-in-part.

BACKGROUND

The invention is directed to an apparatus and method for measuring the slant range S and altitude H of a target in a bistatic radar[2] system.

Claim 1 is reproduced below.

> 1. A bistatic passive radar system for use in conjunction with a host transmitter that is a determinable distance D from the radar system, and which includes means for determining the distance D, a display and means for displaying video images of a selected target, the position of the radar system and the position of the transmitter on the display, characterized by

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[2] "Bistatic radar" is defined as "[a] radar using antennas at different locations for transmission and reception." The New IEEE Standard Dictionary of Electrical and Electronics Terms (IEEE, Inc. 5th ed. 1993). "Bistatic passive radar" is further discussed in U.S. Patent 4,281,327, issued July 28, 1981, to L.M. Frazier (one of the co-inventors of this application) and W.H. Johnson, at column 1, lines 6-36.

means for using the display to determine the slant range S and the altitude H of the selected target relative to the position of the radar system.

Independent claim 16 is a method counterpart to claim 1.

The Examiner relies on the following prior art:

Harris 2,639,422 May 19, 1953

Claims 1 and 16 stand rejected under 35 U.S.C. § 102(a) as being anticipated by Harris.

We refer to the Final Rejection (Paper No. 7) and the Examiner's Answer (Paper No. 13) (pages referred to as "EA__") for a statement of the Examiner's position and to the Appeal Brief (Paper No. 11) (pages referred to as "Br__") for a statement of Appellants' arguments thereagainst.

OPINION

Teachings of Harris

Harris discloses a bistatic radar system having a host transmitter at A, a receiver at B located a distance D from A, and a target P at a height y and a slant range S_2 from B, as shown in figure 1. As acknowledged by Appellants (Br12-13): "Target images are displayed on a PPI display which is viewed to determine an indication of slant range S_2

and altitude y to a selected target." The design of the PPI display would look something like figure 7 of Harris (col. 3, lines 34-41). As the elevation angle of the antenna changes, the spot is scanned along the elevation angle on the screen, the intensity of the spot is modulated, and the location of the target is indicated as a bright spot along the scanning line (col. 8, lines 42-53). The intersection of the scanning lines represents the location of the receiver. As shown in figures 8 and 9, a large target (such as a large irregularity in the transmission path) may appear as spots on several scanning lines 122. The distance to the spot along the scanning line is linearly proportional to the distance S_2 to the target (col. 8, lines 52-53). The horizontal axis on the display corresponds to distance x and the vertical axis on the display corresponds to the height y (col. 15, lines 5-59). The scanning lines may be shifted to one side of the display with a bias voltage as illustrated in figures 8 and 9 (col. 15, lines 56-59). The PPI displays the coordinates of the target with reference to a rectangular frame of reference (col. 4, lines 64-70), presumably a rectangular

grid on the display as shown in figure 7. The "fixed distance of approximately 500,000 feet between the transmitter and receiver . . . [is] represented by an oscilloscope scanning line of four inches" (col. 3, lines 38-41); thus, the location of the transmitter is implicitly shown on the display. The display is used to determine the altitude y to the target by measuring the vertical distance of the spot using the grid and is used to determine the slant range S_2 to the target by measuring the distance along a scanning line from the intersection point of the scanning lines to the spot or measuring the horizontal and vertical distances on the grid and computing the length of the hypotenuse.

Claim 1

Appellants argue (Br14-15): "The PPI display of Harris is not 'used' to determine the slant range and altitude; it is merely viewed. . . . It is applicant's position that merely viewing the display is not a use of the display. 'Use' of the display requires some manipulation of the display, as in the case of the present invention." The Examiner responds (EA3): "The conventional reference

markings on the display screen taught by Harris constitute means for using the display to the same extent that the cursor is the means for using appellant's display. The reference marking on the Harris display screen and the cursor on the appellant's display screen are both used to get the desired target information."

Claim 1 recites "means for using the display to determine the slant range S and the altitude H of the selected target relative to the position of the radar system." At the time the rejection was made, the Examiner's reasoning that the markings constitute means for performing the function of determining the slant range S and altitude would have been persuasive because the Patent and Trademark Office's position was that any structure for performing the function would satisfy a means-plus-function limitation. However, the intervening case of In re Donaldson Co., Inc., 16 F.3d 1189, 29 USPQ2d 1845 (Fed. Cir. 1994) (en banc), requires us to construe means-plus-function limitations "to cover the corresponding structure, material, or acts described in the specification and equivalents thereof" under 35 U.S.C. § 112, sixth paragraph. Although

Appellants' invention requires some human interaction to manually adjust the length of the B cursor to extend from the displayed position R_x of the radar system to the R_c cursor as shown in figure 6, after that, circuitry is used to change the adjusted B cursor length to a horizontal range C (box 48 in figure 2) and to calculate the slant range S and altitude H from the computed horizontal range C and known elevation angle E (box 49 in figure 2). Thus, the corresponding structure in the specification for performing at least part of the function is circuitry. We find that the markings on the display in Harris are not equivalent to this circuitry, because they do not perform the recited function in substantially the same way. Thus, we find that Harris does not anticipate claim 1. The rejection of claim 1 is reversed.

Claim 16

Claim 16 is a method claim and does not invoke the analysis of § 112, sixth paragraph. The display in Harris is "used" to determine the slant range and altitude of the selected target by measuring lengths on the display. We do not agree with Appellants' argument that "'[u]se' of the

display requires some manipulation of the display, as in the case of the present invention" (Br14-15). The method limitation of "using the display" is broad and does not recite any particular steps of how the display is used. The claims broadly encompass use of the display and its graticules by a human.

Appellants also argue (Br15): "[T]he requirement that the selected target be in the same vertical plane as the transmitting and receiving antennas makes the Harris system essentially nonfunctional for accurately determining slant range and altitude even by viewing, since such requirement will almost never be met in actual usage of the system." The Examiner responds that this argument is "of no moment since the accuracy of the system is not claimed" (EA3).

What the Examiner really means to say is that claims 1 and 16 do not require determination of a slant range S and an altitude H to a target that is not located on a plane between the transmitter and receiver. In any case, Harris discloses that the target could have a z coordinate, but it is assumed for the analysis that the antenna scans in the x-y plane only (col. 5, lines 54-57). Thus, Harris teaches

that the system could be adapted to a target not located on the x-y plane.

We find that claim 16 is anticipated by Harris. The rejection of claim 16 is sustained.

CONCLUSION

The rejection of claim 1 is reversed and the rejection of claim 16 is sustained.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

JAMES D. THOMAS Administrative Patent Judge	)	
KENNETH W. HAIRSTON Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
LEE E. BARRETT Administrative Patent Judge	)	

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